

What is claimed is:

1. A transmission mechanism with a single differential mechanism for an automotive vehicle comprising:
 - 5 a drive housing (30) having a first bearing bracket (301) disposed at the upper portion thereof, a second bearing bracket (302) and a third bearing bracket (303) disposed at the middle portion thereof, a fourth bearing bracket (304) disposed at the right lower portion thereof, and a fifth bearing bracket (305) disposed at the left lower portion thereof;
 - a differential mechanism (13) including a right side bevel gear (11), a left side bevel gear
10 (14), a left ring gear (6) and a right ring gear (9), planetary gears (131), and differential cases (133, 134);
 - a driving power input shaft (1) mounted within said first bearing bracket (301);
 - a first gear (4) mounted on said driving power input shaft (1);
 - a first dual tandem gear (5) mounted on said driving power input shaft (1);
 - 15 a first sliding dual tandem gear (7) slidably mounted on said driving power input shaft (1);
 - a second sliding dual tandem gear (8) slidably mounted on said driving power input shaft (1) and engaged to said first sliding dual tandem (7);
 - a front left wheel output shaft (23) mounted within said second bearing bracket (302), on which said left side bevel gear (14) is mounted;
 - 20 a rear right wheel output shaft (12) mounted within said third bearing bracket (303), on which said right side bevel gear (11) is mounted;
 - a second gear (2) fixed to said front left wheel output shaft (23);
 - a second dual tandem gear (3) mounted on said front left wheel output shaft (23);
 - a third gear (10) connected with a right side bevel gear (11);

a front right wheel output shaft (22) mounted within said fourth bearing bracket (304);

a first connecting shaft (15) connected with said front right wheel output shaft (22) via a first slidable engaging member (18);

a fourth gear (16) fixed to said first connecting shaft (15) and meshing with said third gear (10);

a rear left wheel output shaft (17) mounted within said fifth bearing bracket (305);

a second connecting shaft (20) connected to said rear left wheel output shaft (17) via a second slidable engaging member (19); and

a fifth gear (21) fixed to said concentric shaft (15) and meshing with said second gear (2),

wherein when said driving power input shaft (1) is driven, said first sliding gear (7) can be regulated to mesh with said left ring gear (6) or said second sliding gear (8) can be regulated to mesh with said right ring gear (9) so that the automotive vehicle can obtain different speeds, and wheels at the same side of the automotive vehicle can be driven at the same time.

2. The transmission mechanism of claim 1, wherein said front left wheel output shaft (23), said rear left wheel output shaft (17), said front right wheel output shaft (22), and said rear right wheel output shaft (12) are disposed at a same plane.

3. The transmission mechanism of claim 1, wherein said first sliding dual tandem gear (7) provides an inner gear (701) to mesh with a first smaller gear (501) of said first dual tandem gear (5).

4. The transmission mechanism of claim 2, wherein said first sliding dual tandem gear (7) provides an inner gear (701) to mesh with a first smaller gear (501) of said first dual tandem gear (5).

5. The transmission mechanism of claim 1, wherein said second dual tandem gear (3) includes a second larger gear (333) and a second smaller gear (331) to respectively mesh with said first gear (4) and said first larger gear (503) of said first dual tandem gear (5).

6. The transmission mechanism of claim 2, wherein said second dual tandem gear (3) includes a second larger gear (333) and a second smaller gear (331) to respectively mesh with said first gear (4) and said first larger gear (503) of said first dual tandem gear (5).

7. The transmission mechanism of claim 3, wherein said second dual tandem gear (3) includes a second larger gear (333) and a second smaller gear (331) to respectively mesh with said first gear (4) and said first larger gear (503) of said first dual tandem gear (5).

8. The transmission mechanism of claim 4, wherein said second dual tandem gear (3) includes a second larger gear (333) and a second smaller gear (331) to respectively mesh with said first gear (4) and said first larger gear (503) of said first dual tandem gear (5).

9. The transmission mechanism of claim 1, wherein said sliding gear (2) is splined to said driving power input shaft (1).

10. The transmission mechanism of claim 2, wherein said sliding gear (2) is splined to said driving power input shaft (1).

11. The transmission mechanism of claim 3, wherein said second dual tandem gear (3) includes a second larger gear (333) and a second smaller gear (331) to respectively mesh with said first gear (4) and said first larger gear (503) of said first dual tandem gear (5).

13. The transmission mechanism of claim 4, wherein said second dual tandem gear (3) includes a second larger gear (333) and a second smaller gear (331) to respectively mesh with said first gear (4) and said first larger gear (503) of said first dual tandem gear (5).

14. The transmission mechanism of claim 5, wherein said second dual tandem gear (3) includes a second larger gear (333) and a second smaller gear (331) to respectively mesh with said first gear (4) and said first larger gear (503) of said first dual tandem gear (5).

15. The transmission mechanism of claim 1, wherein each of said first sliding gear (7), said second sliding gear (8), said first slidable engaging member (18) and said second slidable engaging member (19) provides a recess (71, 81, 181, 191) at the outer surface thereof for connecting a fork,

respectively.

16. The transmission mechanism of claim 1, wherein each of said first sliding gear (7), said second sliding gear (8), said first slidable engaging member (18) and said second slidable engaging member (19) provides a recess (71, 81, 181, 191) at the outer surface thereof for
5 connecting a fork, respectively.

17. The transmission mechanism of claim 2, wherein each of said first sliding gear (7), said second sliding gear (8), said first slidable engaging member (18) and said second slidable engaging member (19) provides a recess (71, 81, 181, 191) at the outer surface thereof for connecting a fork, respectively.

10 18. The transmission mechanism of claim 3, wherein each of said first sliding gear (7), said second sliding gear (8), said first slidable engaging member (18) and said second slidable engaging member (19) provides a recess (71, 81, 181, 191) at the outer surface thereof for connecting a fork, respectively.

15 19. The transmission mechanism of claim 4, wherein each of said first sliding gear (7), said second sliding gear (8), said first slidable engaging member (18) and said second slidable engaging member (19) provides a recess (71, 81, 181, 191) at the outer surface thereof for connecting a fork, respectively.

20 20. The transmission mechanism of claim 5, wherein each of said first sliding gear (7), said second sliding gear (8), said first slidable engaging member (18) and said second slidable engaging member (19) provides a recess (71, 81, 181, 191) at the outer surface thereof for connecting a fork, respectively.